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9	INZZ	7 AND (rollback\$ OR roll\$ ADJ adj1 ADJ back\$)	unrestricted	0	-	
10	INZZ	nest\$ NEAR (database\$ OR data ADJ adj1 ADJ base\$ OR data ADJ adj1 ADJ bank\$ OR transaction\$)	unrestricted	416	show titles	
11	INZZ	10 AND (rollback\$ OR roll ADJ adj1 ADJ back\$)	unrestricted	7	show titles	
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13	INZZ	rollback\$ OR roll\$ ADJ adj1 ADJ back\$	unrestricted	1060	show titles	
14	INZZ	13 AND commit	unrestricted	38	show titles	
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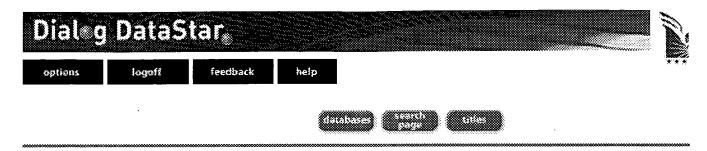
Publication year

Classification codes A: Physics, 0-1

Classification codes A: Physics, 2-3

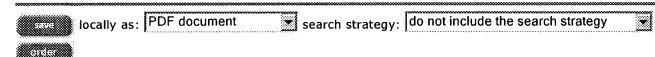
Classification codes A: Physics, 4-5

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- 1 Locking in OODBMS client supporting nested transactions.
- 2 ARIES/NT; a recovery method based on write-ahead logging for nested transac
- 3 Log-based recovery for nested transactions.

document 1 of 3 Order Document

INSPEC - 1969 to date (INZZ)

Accession number & update

4886472, C9504-6160J-012; 950228.

Title

Locking in OODBMS client supporting nested transactions.

Author(s)

Daynes-L; Gruber-O; Valduriez-P; Ed. by Yu-P-S; Chen-A-L-P.

Author affiliation

Inst Nat de Recherche en Inf et Autom, Le Chesnay, France.

Source

Proceedings of the Eleventh International Conference on **Data** Engineering, Taipei, Taiwan, 6-10 March 1995.

Sponsors: IEEE Comput. Soc. Tech. Committee on **Data** Eng., Nat. Tsing Hua Univ., Providence Univ., Taiwan.

In: p.316-23, 1995.

ISSN

ISBN: 0-8186-6910-1, CCCC: 1063-6382/95/ (\$4.00).

Publication year

1995.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

P Practical.

Abstract

Nested transactions facilitate the control of complex persistent applications by enabling both fine-tuning of the scope of **rollback** and safe **intra-transaction** parallelism. We are concerned with supporting concurrent **nested transactions** on client workstations of an OODBMS. Use of the traditional design and implementation of a lock manager results in a high CPU overhead: in-cache traversals of the 007 benchmark perform, at best, 4.5 times slower than the same traversal achieved in virtual memory by a nonpersistent programming language. We propose a new design and implementation of a lock manager which cuts that factor down to 1.8. This lock manager supports

nested transactions with both sibling and parent/child parallelisms, and provides object locking at a cost comparable to page locking. Object locking is therefore a better alternative due to its higher functionality. (8 refs).

Descriptors

<u>cache-storage</u>; <u>client-server-systems</u>; <u>concurrency-control</u>; <u>distributed-databases</u>; <u>object-oriented-databases</u>; <u>software-performance-evaluation</u>; <u>transaction-processing</u>; <u>workstations</u>.

Keywords

OODBMS client supporting **nested transactions**; object locking; complex persistent applications; **rollback**; safe intra **transaction** parallelism; concurrent **nested transactions**; client workstations; lock manager; in cache traversals; 007 benchmark; parent child parallelism; sibling parallelism.

Classification codes

C6160J	(Object-oriented databases).
C6150N	(Distributed systems software).
C6120	(File organisation).
C6160B	(Distributed databases).

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INSPEC - 1969 to date (INZZ)

Accession number & update

3965793, C91059234; 910829.

Title

ARIES/NT: a recovery method based on write-ahead logging for nested transactions.

Author(s)

Rothermel-K; Mohan-C; Ed. by Apers-P-M-G; Wiederhold-G.

Author affiliation

IBM European Networking Center, Heidelberg, Germany.

Source

Proceedings of the Fifteenth International Conference on Very Large **Data Bases**, Amsterdam, Netherlands, 22-25 Aug. 1989, p.337-46.

Published: Morgan Kaufmann, Palo Alto, CA, USA, 1989, xii+467 pp.

Publication year

1989.

Language

EÑ.

Publication type

CPP Conference Paper.

Treatment codes

P Practical.

Abstract

A simple and efficient recovery method for **nested transactions**, called ARIES/NT (algorithm for recovery and isolation exploiting semantics for **nested transactions**), that uses write-ahead logging and supports semantically-rich modes of locking and operation logging is presented. This method applies to a very general model of **nested transactions**, which includes partial **rollbacks** of subtransactions, upward and downward inheritance of locks, and concurrent execution of ancestor and descendent subtransactions. The adopted system architecture also compasses aspects of distributed **data base** management. ARIES/NT is an extension of the ARIES recovery and concurrency control method developed recently for the single-level **transaction** model by Mohan, et al. in the IBM Research Report RJ6649. (20 refs).

Descriptors

concurrency-control; distributed-databases; transaction-processing.

Keywords

ARIES NT; recovery method; write ahead logging; nested transactions; semantically rich modes of locking; operation logging; partial rollbacks; inheritance; concurrent execution; distributed data base management; concurrency control method.

Classification codes

C6160B (Distributed DBMS).

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document 3 of 3 Order Document

INSPEC - 1969 to date (INZZ)

Accession number & update

3067233, C88013852; 880000.

Title

Log-based recovery for nested transactions.

Author(s)

Moss-J-E-B; Ed. by Stocker-P-M; Kent-W; Hammersley-P.

Author affiliation

Dept of Comput & Inf Sci, Massachusetts Univ, Amherst, MA, USA.

Source

Proceedings of the Thirteenth International Conference on Very Large Data Bases: 1987 13th VLDB, Brighton, UK, 1-4 Sept. 1987, p.427-32.

Sponsors: Alvey, ICL, RTI, et al.

Published: Morgan Kaufmann, Los Altos, CA, USA, 1987, xii+518 pp

Translation of: C04.

Publication year

1987.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

P Practical.

Abstract

Techniques similar to shadow pages have been suggested for use in rollback and crash recovery for nested transactions. However, undo /redo log methods have not been presented, though undo/redo logs are widely used for transaction recovery, and perhaps preferable to shadow methods. The author develops a scheme of log-based recovery for nested transactions. The resulting design is promising because it requires a relatively small number of extensions to a similar scheme of recovery for singlelevel transactions. (14 refs).

Descriptors

database-management-systems; system-recovery.

Keywords

nested transactions; shadow pages; rollback; crash recovery; undoredo logs; log based recovery. Classification codes

C6150J (Operating systems).

C6160 (Database management systems (DBMS)).

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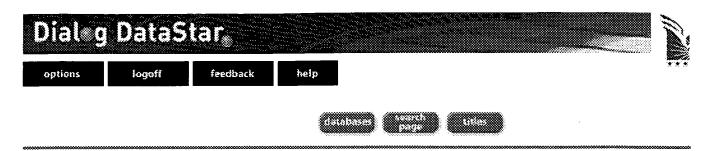
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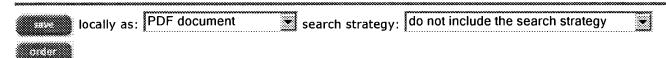
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- 6 A semantic-based nested transaction model for intelligent and cooper
- 7 Nested transaction based reliable distributed computing environment for a
- 8 Hybrid atomicity for nested transactions.
- 9 A concurrency control scheme for nested transactions.

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INSPEC - 1969 to date (INZZ)

Accession number & update

7629745, B2003-06-6210L-189, C2003-06-5620-050; 20030526.

Title

Commitment of mobile distributed real-time nested transaction.

Author(s)

Liu-Yun-Sheng; Liao-Guo-Qiong; Li-Guo-Hui; Xia-Jia-Li.

Author affiliation

Sch of Comput Sci & Technol, Huazhong Univ of Sci & Technol, Wuhan, China.

Source

Journal-of-Software (China), vol.14, no.1, p.139-45, Jan. 2003. , Published: Science Press.

CODEN

RUXUEW.

ISSN

ISSN: 1000-9825.

Availability

SICI: 1000-9825(200301)14:1L.139:CMDR; 1-M.

Publication year

2003.

Language

CH.

Publication type

J Journal Paper.

Treatment codes

P Practical.

Abstract

For transaction mobility and the inherence limitations of wireless networks, traditional real-time transaction management mechanisms are incompetent to support the execution of mobile distributed real-time transactions in a mobile distributed computing environment. In this paper, the commit mechanism for mobile real-time transactions is studied. First, a nested transaction model based on functional alterative tasks is given by analyzing the characteristics of real-time transactions in a mobile distributed environment. Then a three-tier commit structure supporting the suggested model is presented. A three-phase real-time commit protocol 3PRTC (three-phase real-time commit) is also proposed, which can guarantee the atomicity and structural correctness of the mobile real-time transactions. By performance testing, it is shown that the suggested transaction model and its commit mechanism can improve the successful ratio of real-time transactions. (9 refs).

Descriptors

mobile-computing; protocols; real-time-systems; transaction-processing; wireless-LAN.

Keywords

mobile distributed real time **nested transaction**; **transaction** mobility; wireless networks; real time **transaction** management; **commit** mechanism; mobile computing; three tier **commit** structure; three phase real time **commit** protocol; 3PRTC; performance testing.

Classification codes

B6210L	(Computer communications).
B6150M	(Protocols).
C5620	(Computer networks and techniques).
C6150N	(Distributed systems software).
C5640	(Protocols).

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INSPEC - 1969 to date (INZZ)

Accession number & update

6572114, C2000-06-6160B-009; 20000401.

Title

Open **nested transaction:** a support for increasing performance and for multi-tier applications.

Author(s)

Saheb-M; Karoui-R; Sedillot-S; Ed. by Saake-G; Schwarz-K; Turker-C.

Author affiliation

Inst Nat de Recherche en Inf et Autom, Le Chesnay, France.

Source

Proceedings of TDD'99: **Transactions** and **Database** Dynamics - Eighth International Workshop on Foundations of Models and Languages for **Data** and Objects, Schloss Dagstuhl, Germany, 27-30 Sept. 1999.

In: p.115-38, 1999.

Publication year

1999.

Language

EÑ.

Publication type

CPP Conference Paper.

Treatment codes

P Practical.

Abstract

The concept of a transaction has been developed to permit management of activities and resources in

a reliable computing environment. The two-phase commit protocol is combined with the strict twophase locking protocol, as the means for ensuring atomicity and the serializability of transactions. The implication of this combination on the length of time a transaction may hold locks on various data items might be severe. There are certain classes of application where it is known that resources acquired within a transaction can be "released early", rather than having to wait until the transaction terminates. Furthermore, there are applications involving heterogeneous competing business organizations, which do not allow to block their resources; therefore, the preservation of local autonomy of individual systems is crucial. It is undesirable, for example, to use a protocol where a site belonging to a competing organization can harmfully block their local resources. Several enhancements to the traditional transaction model have been proposed either by relaxing the conventional ACID properties or by providing an asynchronous communication. This paper describes an extension of the OTS, by adding the Open Nested Transaction Model, which improves greatly transaction parallelism by releasing the nested transaction locks at the nested transaction commit time. Open nested transactions relax the isolation property by allowing the effects of the committed nested transaction to be visible to concurrent transactions. We describe also how we take the benefit of this model, through the proposed Asynchronous Nested Transaction model, to overcome the limits of the actual messaging products and standard specifications when they are confronted with the problem of guaranteeing the atomicity of distributed multi-tier transactional applications. (25 refs).

Descriptors

distributed-databases; memory-protocols; software-performance-evaluation; transaction-processing.

Keywords

performance; distributed multi tier **transactional** applications; two phase **commit** protocol; two phase locking protocol; atomicity; serializability; heterogeneous competing business organizations; protocol; Open **Nested Transaction** Model; **transaction** parallelism; **nested transaction** locks; Asynchronous **Nested Transaction** mode.

Classification codes

C6160B (Distributed databases).

C6150N (Distributed systems software).

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INSPEC - 1969 to date (INZZ)

Accession number & update

5972390, C9808-6160J-015; 980715.

Title

A concurrency control algorithm for an open and safe **nested transaction** model.

Author(s)

Madria-S-K.

Author affiliation

Sch of Comput Sci, Univ Sains Malaysia, Penang, Malaysia.

Source

Proceedings of 1st International Conference on Information Communications and Signal Processing, vol.2, Singapore, 9-12 Sept. 1997.

In: p.907-12 vol.2, 1997.

ISSN

ISBN: 0-7803-3676-3, CCCC: 0 7803 3676 3/97/ (\$10.00).

Publication year

1997.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

T Theoretical or Mathematical.

Abstract

We present a concurrency control algorithm for an open and safe **nested transaction** model. We use prewrite operations in our model to increase the concurrency. Prewrite operations are modeled as subtransactions in the **nested transaction** tree. The subtransaction which initiates prewrite subtransactions are modelled as recovery point subtransaction. The recovery point subtransaction can release their locks before its ancestors **commit.** Thus, our model increases the concurrency in comparison to other **nested transaction** models. Our model is useful an environment of long-running **transactions** common in object oriented **databases**, computer aided design and in the software development process. (29 refs).

Descriptors

CAD; concurrency-control; database-theory; object-oriented-databases; software-engineering.

Keywords

safe **nested transaction** model; open **nested transaction** model; concurrency control algorithm; prewrite operations; **nested transaction** tree; long running **transactions**; recovery point subtransaction; prewrite subtransactions; object oriented **databases**; computer aided design; software development process.

Classification codes

C6160J (Object-oriented databases).
C6110B (Software engineering techniques).
C4250 (Database theory).

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INSPEC - 1969 to date (INZZ)

Accession number & update

5309668, C9608-6160-006; 960702.

Title

Commit scope control in nested transactions.

Author(s)

Qiming-Chen; Dayal-U; Ed. by Apers-S; Bouzeghoub-M; Gardarin-G.

Author affiliation

Hewlett-Packard Lab, Palo Alto, CA, USA.

Source

Proceedings of 5th Conference on Extended **Database** Technology (EDBT'96), Avignon, France, 25-29 March 1996.

In: p.621-4, 1996.

ISSN

ISBN: 3-540-61057-X.

Publication year

1996.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

P Practical; T Theoretical or Mathematical.

Abstract

A common limitation of all the existing nested transaction models is that they only allow

subtransactions to **commit** either to parent **transactions** or to **databases.** In order to adequately balance atomicity and concurrency at selected levels of a **transaction** hierarchy, the notion of scoped commitment is proposed, that allows a subtransaction to **commit** to a selected ancestor independently of its parent, making its results visible to that ancestor and thus improving the concurrency in the **transaction** subtree beneath that ancestor. A corresponding scoped undo approach is also developed that allows a **transaction** hierarchy with subtransactions having mixed **commit** scopes to partially and consistently roll back upon failure, then restart and roll forward. (4 refs).

Descriptors

<u>concurrency-control</u>; <u>database-management-systems</u>; <u>database-theory</u>; <u>transaction-processing</u>.

Keywords

commit scope control; **nested transactions**; subtransactions; parent **transactions**; **databases**; atomicity; concurrency control; **transaction** hierarchy; scoped commitment; selected ancestor; **transaction** subtree; scoped undo approach; mixed **commit** scopes; failure; restart; roll back; roll forward.

Classification codes

```
C6160 (Database management systems (DBMS)).
C4250 (Database theory).
C6130 (Data handling techniques).
```

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INSPEC - 1969 to date (INZZ)

Accession number & update

5073017, C9511-6160B-023; 951004.

Title

Hybrid atomicity for **nested transactions**.

Author(s)

Fekete-A; Lynch-N; Weihl-W-E.

Author affiliation

Sydney Univ, NSW, Australia.

Source

ICDT 92. International Conference on **Database** Theory, Berlin, Germany, 14-16 Oct. 1992. In: Theoretical-Computer-Science (Netherlands), vol.149, no.1, p.151-78, 18 Sept. 1995.

CODEN

TCSCDI.

ISSN

ISSN: 0304-3975, CCCC: 0304-3975/95/ (\$09.50).

Publication year

1995.

Language

EN.

Publication type

CPP Conference Paper, J Journal Paper.

Treatment codes

P Practical.

Abstract

This paper defines the notion of hybrid atomicity for nested transaction systems, and presents and

verifies an algorithm providing this property. Hybrid atomicity is a modular property; it allows the correctness of a system to be deduced from the fact that each object is implemented to have the property. It allows more concurrency than dynamic atomicity, by assigning timestamps to **transactions** at **commit.** The Avalon system provides exactly this facility. The results in this paper extend earlier work using the same model for locking and **timestamp-based** algorithms, providing further evidence for the generality of the approach. However, there are some subtle differences with the definitions used in earlier work, showing the difficulties of developing precise general models for **nested transaction** systems. (16 refs).

Descriptors

abstract-data-types; concurrency-control; transaction-processing.

Keywords

hybrid atomicity; **nested transactions**; modular property; timestamps; Avalon system; locking; timestamp **based** algorithms; **nested transaction** systems.

Classification codes

C6160B (Distributed databases).
C6150J (Operating systems).
C6120 (File organisation).

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INSPEC - 1969 to date (INZZ)

Accession number & update

4664013, C9406-6160K-009; 940427.

Title

A **semantic-based nested transaction** model for intelligent and cooperative information systems.

Author(s)

Haghjoo-M-S; Papazoglou-M-P; Schmidt-H-W; Ed. by Huhns-M; Papazoglou-M-P; Schlageter-G.

Author affiliation

Dept of Comput Sci, Australian Nat Univ, Canberra, ACT, Australia.

Source

Proceedings of International Conference on Intelligent and Cooperative Information Systems, Rotterdam, Netherlands, 12-14 May 1993.

Sponsors: IEEE, ACM, AAAI, IFIP, IPSJ, NGI.

In: p.321-31, 1993.

ISSN

ISBN: 0-8186-3135-X, CCCC: 0 8186 3135 X/93/ (\$3.00).

Publication year

1993.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

T Theoretical or Mathematical.

Abstract

Intelligent and cooperative information systems (ICIS) involve upgraded models for **transaction** support for large distributed **data** /knowledge intensive applications. The use of long-lived **transactions** results in the introduction of a flexible **transaction** model which employs weak integrity and optimistic **commit** mechanisms for **transactions** relying on compensating and contingency **transactions** to recover from potential semantic failures. An **open-nested transaction** model for

ICIS is introduced. It provides linguistic facilities for defining and controlling long-lived complex **transactions** (comprising related units of work) by taking into account the semantics of distributed computations. The fact that the proposed **transaction** model is grafted on to an appropriately extended concurrent object-oriented programming language allows exhibiting a high degree of parallelism inherent in distributed **transaction-oriented** applications. (28 refs).

Descriptors

cooperative-systems; database-theory; deductive-databases; distributed-databases; information-systems; object-oriented-languages; parallel-languages; system-recovery; transaction-processing.

Keywords

semantic **based nested transaction** model; intelligent information systems; cooperative information systems; upgraded models; **transaction** support; large distributed **data** applications; knowledge intensive applications; related work units; weak integrity; optimistic **commit** mechanisms; compensating **transactions**; contingency **transactions**; semantic failure recovery; open **nested transaction** model; linguistic facilities; long lived complex **transactions**; distributed computations; extended concurrent object oriented programming language; parallelism; distributed **transaction** oriented applications.

Classification codes

C6160K	(Deductive databases).
C6110J	(Object-oriented programming)
C6140D	(High level languages).
C6160B	(Distributed DBMS).
C4250	(Database theory).

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INSPEC - 1969 to date (INZZ)

Accession number & update

4426791, C9307-6150N-038; 930610.

Title

Nested transaction based reliable distributed computing environment for a network of workstations. **Author(s)**

Kanai-T; Shirakihara-T.

Author affiliation

Res & Dev Center, Toshiba Corp, Tokyo, Japan.

Source

Transactions-of-the-Information-Processing-Society-of-Japan (Japan), vol.33, no.11, p.1384-93, 1992.

CODEN

JSGRD5.

ISSN

ISSN: 0387-5806.

Publication year

1992.

Language

JA.

Publication type

J Journal Paper.

Treatment codes

P Practical.

Abstract

Describes an implementation method for distributed transactions; the functions needed for distributed

transaction processing; the system configuration; the structure of a multi-thread remote procedure call (RPC) server; message flow for distributed **transaction** processing; message flow for **commit** processing; an RPC specification; application programs for client and server; the performance of RPCs; the behaviour of the program to be measured; and the time required for **commit** processing. (14 refs).

Descriptors

<u>distributed-processing</u>; <u>local-area-networks</u>; <u>remote-procedure-calls</u>; <u>transaction-processing</u>; <u>workstations</u>.

Keywords

nested transactions; workstation network; multithread remote procedure call server; client server system; reliable distributed computing environment; distributed **transaction** processing; system configuration; message flow; **commit** processing; RPC specification; performance.

Classification codes

C6150N (Distributed systems).

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INSPEC - 1969 to date (INZZ)

Accession number & update

4310729, C9302-4250-021; 921216.

Title

Hybrid atomicity for nested transactions.

Author(s)

Fekete-A; Lynch-N; Weihl-W-E; Ed. by Biskup-J; Hull-R.

Author affiliation

Dept of Comput Sci, Sydney Univ, NSW, Australia.

Source

Database Theory - ICDT '92. 4th International Conference Proceedings, Berlin, Germany, 14-16 Oct. 1992, p.216-30.

Published: Springer-Verlag, Berlin, Germany, 1992, ix+449 pp.

ISSN

ISBN: 3-540-56039-4.

Publication year

1992.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

T Theoretical or Mathematical.

Abstract

Defines the notion of hybrid atomicity for **nested transaction** systems, and presents and verifies an algorithm providing this property. Hybrid atomicity is a modular property; it allows the correctness of a system to be deduced from the fact that each object is implemented to have the property. It allows more concurrency than dynamic atomicity, by assigning timestamps to **transactions** at **commit.** The Avalon system provides exactly this facility. (17 refs).

Descriptors

<u>concurrency-control</u>; <u>database-theory</u>; <u>distributed-databases</u>; <u>program-verification</u>; <u>transaction-processing</u>.

Keywords

algorithm verification; system correctness; **nested transactions**; hybrid atomicity; modular property; concurrency; timestamps; **commit**; Avalon system.

Classification codes

C4250 (Database theory).

C6160B (Distributed DBMS).

C4240 (Programming and algorithm theory).

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INSPEC - 1969 to date (INZZ)

Accession number & update

3381584, C89038424; 890000.

Title

A concurrency control scheme for nested transactions.

Author(s)

Shin-D-C; Moon-S-C.

Author affiliation

Dept of Comput Sci, Korea Adv Inst of Sci & Technol, Seoul, South Korea.

Source

Fourteenth EUROMICRO Symposium on Microprocessing and Microprogramming (EUROMICRO '88), Zurich, Switzerland, 29 Aug.-1 Sept. 1988.

Sponsors: Bank Leu, Control Data (Schweiz), GEI Systeme, et al.

In: Microprocessing-Microprogramming (Netherlands), vol.25, no.1-5, p.233-8, Jan. 1989.

CODEN

MMICDT.

ISSN

ISSN: 0165-6074.

Publication year

1989.

Language

EN.

Publication type

CPP Conference Paper, J Journal Paper.

Treatment codes

P Practical.

Abstract

Locking rules for concurrency control in **nested transaction** model, in which parent/child parallelism, sibling parallelism, and arbitrary commitment-dependence relationship between **transactions** are allowed, are presented. The locking rules are **based** on the lock transformation scheme that never allows the **commit** deadlock to occur, which could happen by permitting parent/child parallelism. In addition, two proposed locking rules are compared to each other with respect to the overhead involved in cascading abort, the degree of concurrency, and the frequency of deadlock occurrences. (14 refs).

Descriptors

parallel-processing.

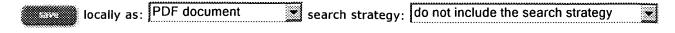
Keywords

locking rules; concurrency control scheme; **nested transactions**; parentchild parallelism; sibling parallelism; arbitrary commitment dependence relationship; cascading abort.

Classification codes

C5440 (Multiprocessor systems and techniques).

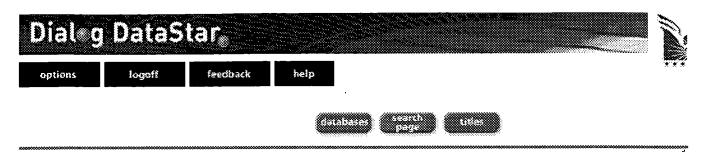
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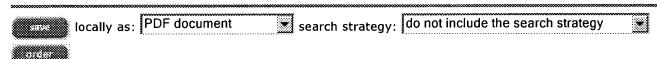
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INSPEC - 1969 to date (INZZ)

Accession number & update

7629745, B2003-06-6210L-189, C2003-06-5620-050; 20030526.

Title

Commitment of mobile distributed real-time nested transaction.

Author(s)

Liu-Yun-Sheng; Liao-Guo-Qiong; Li-Guo-Hui; Xia-Jia-Li.

Author affiliation

Sch of Comput Sci & Technol, Huazhong Univ of Sci & Technol, Wuhan, China.

Source

Journal-of-Software (China), vol.14, no.1, p.139-45, Jan. 2003., Published: Science Press.

CODEN

RUXUEW.

ISSN

ISSN: 1000-9825.

Availability

SICI: 1000-9825(200301)14:1L.139:CMDR; 1-M.

Publication year

2003.

Language

CH.

Publication type

J Journal Paper.

Treatment codes

P Practical.

Abstract

For transaction mobility and the inherence limitations of wireless networks, traditional real-time transaction management mechanisms are incompetent to support the execution of mobile distributed real-time transactions in a mobile distributed computing environment. In this paper, the commit mechanism for mobile real-time transactions is studied. First, a nested transaction model based on functional alterative tasks is given by analyzing the characteristics of real-time transactions in a mobile distributed environment. Then a three-tier commit structure supporting the suggested model is presented. A three-phase real-time commit protocol 3PRTC (three-phase real-time commit) is also proposed, which can guarantee the atomicity and structural correctness of the mobile real-time transactions. By performance testing, it is shown that the suggested transaction model and its commit mechanism can improve the successful ratio of real-time transactions. (9 refs).

Descriptors

mobile-computing; protocols; real-time-systems; transaction-processing; wireless-LAN.

Keywords

mobile distributed real time **nested transaction**; **transaction** mobility; wireless networks; real time **transaction** management; **commit** mechanism; mobile computing; three tier **commit** structure; three phase real time **commit** protocol; 3PRTC; performance testing.

Classification codes

```
B6210L (Computer communications).
B6150M (Protocols).
C5620 (Computer networks and techniques).
C6150N (Distributed systems software).
C5640 (Protocols).
```

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INSPEC - 1969 to date (INZZ)

Accession number & update

7440411, C2002-12-6150N-064; 20021104.

Title

Relaxed atomic commit for real-time transactions in mobile computing environment.

Author(s)

YunSheng-Liu; GuoQiong-Liao; GuoHui-Li; JiaLi-Xia; Ed. by Meng-X; Su-J; Wang-Y.

Author affiliation

Coll of Comput Sci & Technol, Huazhong Univ of Sci & Technol, Hubei, China.

Source

Advances in Web-Age Information Management. Third International Conference, WAIM 2002. Proceedings, Beijing, China, 11-13 Aug. 2002.

Sponsors: Nat. Sci. Found. China, Microsoft Res. Asia, Oracle (China), IBM DB22(China). In: p.397-408, 2002.

ISSN

ISBN: 3-540-44045-3.

Publication year

2002.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

P Practical.

Abstract

It is more difficult for real-time transactions in mobile computing environment (MCE) to meet their deadlines than that in traditional distributed computing environment due to the mobility of transactions and inherent limitations of wireless network. It is necessary to study new transaction management mechanisms for mobile real-time transactions (MRTTs) to make more of them successful. In the first of the paper, functional alternative tasks are suggested for important MRTTs in the interest of enhancing their reliability. Then a nested mobile real-time transaction model based on functional alternation is presented. For guaranteeing the relaxed atomicity and structure correctness of MRTTs, a Three-Phase Real-Time Commit protocol (3PRTC) taking the deadlines associated with MRTTs and mobility into consideration is proposed. In the end, the correctness of 3PRTC is proved. (14 refs).

Descriptors

mobile-computing; real-time-systems; transaction-processing; transport-protocols.

Keywords

real time transactions; mobile computing environment; wireless network; transaction management mechanisms; functional alternative tasks; nested mobile real time transaction model; functional alternation; relaxed atomicity; structure correctness; Three Phase Real Time Commit protocol; relaxed atomic commit.

Classification codes

C6150N (Distributed systems software).

C5640 (Protocols).

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INSPEC - 1969 to date (INZZ)

Accession number & update

7011434, C2001-09-4250-013; 20010813.

Title

A theory of transactions on recoverable search trees.

Author(s)

Sippu-S; Soisalon-Soininen-E; Ed. by Van-den-Bussche-J; Vianu-V.

Author affiliation

Dept of Comput Sci, Helsinki Univ, Finland.

Source

Proceedings of 8th International Conference on **Database** Theory, London, UK, 4-6 Jan. 2001. Sponsors: Eur. Union, Eur. Res. Consortium for Inf. & Math.

In: p.83-98, 2001.

ISSN

ISBN: 3-540-41456-8.

Publication year

2001.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

T Theoretical or Mathematical.

Abstract

We consider transactions running on a database that consists of records with unique totally-ordered keys and is organized as a sparse primary search tree such as a B-tree index on disk storage. We extend the classical read-write model of transactions by considering inserts, deletes and key-range scans and by distinguishing between four types of transaction states: forward-rolling, committed, backward-rolling, and rolled-back transactions. A search-tree transaction is modelled as a two-level transaction containing structure modifications as open nested subtransactions that can commit even though the parent transaction aborts. Isolation conditions are defined for search-tree transactions with nested structure modifications that guarantee the structural consistency of the search tree, a required isolation level (including phantom prevention) for database operations, and recoverability for structure modifications and database operations. (20 refs).

Descriptors

concurrency-control; database-theory; disc-storage; query-processing.

Keywords

theory of transactions; recoverable search trees; totally ordered keys; sparse primary search tree; B tree index; disk storage; classical read write model; inserts; deletes; key range scans; forward rolling; backward rolling; rolled back transactions; two level transaction; committed transaction; open nested subtransactions; transaction aborts; isolation conditions; structural consistency; phantom prevention; database operations; recoverability; structure modifications.

Classification codes

C4250 (Database theory).

C6160 (Database management systems (DBMS)).

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INSPEC - 1969 to date (INZZ)

Accession number & update

6934616, C2001-07-6160B-001; 20010528.

Title

Research on the transaction commit mechanism for distributed engineering database system.

Author(s)

Liao-Guo-Qiong; Li-Tao-Shen.

Author affiliation

Coll of Comput & Inf Eng, Guangxi Univ, Nanning, China.

Source

Journal-of-Computer-Aided-Design-Computer-Graphics (China), vol.13, no.4, p.357-61, April 2001. Published: Science Press.

CODEN

JFTXFX.

ISSN

ISSN: 1003-9775.

Availability

SICI: 1003-9775(200104)13:4L.357:RTCM; 1-M.

Publication year

2001.

Language

CH.

Publication type

J Journal Paper.

Treatment codes

P Practical.

Abstract

Since the ACID (Atomic, Consistency, Isolation, Durability) properties of **transactions** in distributed engineering **databases** differ from that of conventional ones, the Basic Two-Phase **Commit** (B2PC) protocol no longer fits. **Based** on the **nested** model, we establish a structure for **transaction** management in a distributed engineering **database**. We also propose a new Two-Phase **Commit** protocol with a detailed description of its principle, algorithms and ways of handling failures. (4 refs).

Descriptors

<u>distributed-databases</u>; <u>engineering-information-systems</u>; <u>memory-protocols</u>; <u>transaction-processing</u>.

Keywords

transaction commit mechanism; distributed engineering **database**; ACID properties; **transaction** management; Basic Two Phase **Commit** protocol; **nested** model.

Classification codes

C6160B (Distributed databases).

C6120 (File organisation).

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INSPEC - 1969 to date (INZZ)

Accession number & update

6911931, C2001-06-7180-010; 20010401.

Title

Multi-agent cooperative transactions for e-commerce.

Author(s)

<u>Chen-Q</u>; <u>Dayal-U</u>; <u>Ed</u>. <u>by</u> <u>Etzion-O</u>; <u>Scheuermann-P</u>.

Author affiliation

HP Labs, Hewlett-Packard Co, Palo Alto, CA, USA.

Source

Cooperative Information Systems. 7th International Conference, CoopIS 2000, Eilat, Israel, 6-8 Sept. 2000.

In: p.311-22, 2000.

ISSN

ISBN: 3-540-41021-X.

Publication year

2000.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

T Theoretical or Mathematical.

Abstract

E-commerce is a distributed computing environment with dynamic relationships among a large number of autonomous service requesters, brokers and providers. With the increasing automation of e-commerce applications, we will see the use of software agents that cooperate to perform business **transactions**. Multi-agent cooperative **transactions** are different in their requirements both from conventional atomic **transactions** executed under centralized control and from **nested transactions** executed under hierarchical control. Cooperative **transactions** require peer-to-peer protocols for **commit** control and failure recovery. The significance and feasibility of this approach have been demonstrated in a prototype implemented at HP Labs, using our dynamic agent infrastructure. (12

refs).

Descriptors

electronic-commerce; multi-agent-systems; protocols; software-agents;

Keywords

multi agent cooperative transactions; e commerce; distributed computing environment; dynamic relationships; autonomous service requesters; autonomous service brokers; autonomous service providers; software agents; business transactions; atomic transactions; centralized control; nested transactions; hierarchical control; peer to peer protocols; commit control; failure recovery; dynamic agent infrastructure.

Classification codes

C7180	(Retailing and distribution computing).
C6170	(Expert systems and other AI software and techniques).
C5640	(Protocols).
C6155	(Computer communications software).
C6150G	(Diagnostic, testing, debugging and evaluating systems).
C7120	(Financial computing).

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INSPEC - 1969 to date (INZZ)

Accession number & update

6572114, C2000-06-6160B-009; 20000401.

Title

Open nested transaction: a support for increasing performance and for multi-tier applications.

Author(s)

Saheb-M; Karoui-R; Sedillot-S; Ed. by Saake-G; Schwarz-K; Turker-C.

Inst Nat de Recherche en Inf et Autom, Le Chesnay, France.

Proceedings of TDD'99: Transactions and Database Dynamics - Eighth International Workshop on Foundations of Models and Languages for Data and Objects, Schloss Dagstuhl, Germany, 27-30 Sept. 1999.

In: p.115-38, 1999.

Publication year

1999.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

P Practical.

Abstract

The concept of a transaction has been developed to permit management of activities and resources in a reliable computing environment. The two-phase commit protocol is combined with the strict twophase locking protocol, as the means for ensuring atomicity and the serializability of transactions. The implication of this combination on the length of time a transaction may hold locks on various data items might be severe. There are certain classes of application where it is known that resources acquired within a transaction can be "released early", rather than having to wait until the transaction terminates. Furthermore, there are applications involving heterogeneous competing

business organizations, which do not allow to block their resources; therefore, the preservation of local autonomy of individual systems is crucial. It is undesirable, for example, to use a protocol where a site belonging to a competing organization can harmfully block their local resources. Several enhancements to the traditional **transaction** model have been proposed either by relaxing the conventional ACID properties or by providing an asynchronous communication. This paper describes an extension of the OTS, by adding the Open **Nested Transaction** Model, which improves greatly **transaction** parallelism by releasing the **nested transaction** locks at the **nested transaction commit** time. Open **nested transactions** relax the isolation property by allowing the effects of the committed **nested transaction** to be visible to concurrent **transactions**. We describe also how we take the benefit of this model, through the proposed Asynchronous **Nested Transaction** model, to overcome the limits of the actual messaging products and standard specifications when they are confronted with the problem of guaranteeing the atomicity of distributed multi-tier **transactional** applications. (25 refs).

Descriptors

distributed-databases; memory-protocols; software-performance-evaluation; transaction-processing.

Keywords

performance; distributed multi tier **transactional** applications; two phase **commit** protocol; two phase locking protocol; atomicity; serializability; heterogeneous competing business organizations; protocol; Open **Nested Transaction** Model; **transaction** parallelism; **nested transaction** locks; Asynchronous **Nested Transaction** mode.

Classification codes

C6160B (Distributed databases).

C6150N (Distributed systems software).

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INSPEC - 1969 to date (INZZ)

Accession number & update

5869825, C9805-6150N-010; 980324.

Title

A meta-object protocol for distributed OO applications.

Author(s)

Scinturier-L; Duchien-L; Florin-G; Ed. by Ege-R; Singh-M; Meyer-B.

Author affiliation

CNAM-Lab CEDRIC, Paris, France.

Source

Proceedings of TOOLS USA 97. International Conference on Technology of Object Oriented Systems and Languages, Santa Barbara, CA, USA, 28 July-1 Aug. 1997.

Sponsors: Interactive Software Eng.

In: p.306-17, 1998.

ISSN

ISBN: 0-8186-8383-X, CCCC: 0 8186 8383 X/98/ (\$10.00).

Publication year

1998.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

P Practical.

Abstract

The design of complex distributed object applications such as **transactional** systems (e.g. **nested transactions**, two or three phase **commit** protocols), network algorithms (e.g. routing, spanning tree construction, group causal delivery) or cooperative applications is a hard task. We present a meta-

object protocol (MOP) called CAO-LAC, to assist developers in implementing these applications. A prototype was developed for the language of the GUIDE distributed object system. The MOP uses a state/transition approach to synchronize concurrent objects. We propose some extensions to manage intra-object parallelism. Then we report on a spanning tree construction algorithm that was implemented with this MOP. (27 refs).

Descriptors

<u>distributed-processing</u>; <u>object-oriented-languages</u>; <u>object-oriented-programming</u>; <u>protocols</u>; <u>synchronisation</u>; <u>trees-mathematics</u>.

Keywords

meta object protocol; distributed object oriented applications; **transactional** systems; **nested transactions**; three phase **commit** protocols; two phase **commit** protocols; network algorithms; routing; spanning tree; group causal delivery; cooperative applications; CAO LAC; prototype; GUIDE; state transition approach; concurrent object synchronization; intra object parallelism.

Classification codes

C6150N (Distributed systems software). C6110J (Object-oriented programming).

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INSPEC - 1969 to date (INZZ)

Accession number & update

5706260, C9711-6160B-009; 970930.

Title

Design and evaluation of a new transaction execution model for multidatabase systems.

Author(s)

<u>Devirmis-T; Ulusoy-O.</u>

Author affiliation

Dept of Comput Eng & Inf Sci, Bilkent Univ, Ankara, Turkey.

Source

Information-Sciences (USA), vol.102, no.1-4, p.203-38, Nov. 1997., Published: Elsevier.

CODEN

ISIJBC.

ISSN

ISSN: 0020-0255, CCCC: 0020-0255/97/ (\$17.00).

Availability

SICI: 0020-0255(199711)102:1/4L.203:DETE; 1-V

Electronic Journal Document Number: S0020-0255(97)00015-7.

Publication year

1997.

Language

EN.

Publication type

J Journal Paper.

Treatment codes

T Theoretical or Mathematical.

Abstract

In this paper, we present a new **transaction** execution model that captures the formalism and semantics of various extended **transaction** models and adopts them to a multidatabase system (MDBS) environment. The proposed model covers **nested transactions**, various dependency types among **transactions**, and **commit** independent **transactions**. The formulation of complex MDBS **transaction** types can be accomplished easily with the extended semantics captured in the model. A

detailed performance model of an MDBS is employed in investigating the performance implications of the proposed **transaction** model. (19 refs).

Descriptors

database-theory; distributed-databases; transaction-processing.

Keywords

transaction execution model; multidatabase systems; formalism; semantics; extended **transaction** models; multidatabase system; MDBS; **nested transactions**; dependency types; **commit** independent **transactions**; performance model.

Classification codes

C6160B (Distributed databases).

C4250 (Database theory).

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INSPEC - 1969 to date (INZZ)

Accession number & update

5309668, C9608-6160-006; 960702.

Title

Commit scope control in nested transactions.

Author(s)

Qiming-Chen; Dayal-U; Ed. by Apers-S; Bouzeghoub-M; Gardarin-G.

Author affiliation

Hewlett-Packard Lab, Palo Alto, CA, USA.

Source

Proceedings of 5th Conference on Extended **Database** Technology (EDBT'96), Avignon, France, 25-29 March 1996.

In: p.621-4, 1996.

ISSN

ISBN: 3-540-61057-X.

Publication year

1996.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

P Practical; T Theoretical or Mathematical.

Abstract

A common limitation of all the existing **nested transaction** models is that they only allow subtransactions to **commit** either to parent **transactions** or to **databases**. In order to adequately balance atomicity and concurrency at selected levels of a **transaction** hierarchy, the notion of scoped commitment is proposed, that allows a subtransaction to **commit** to a selected ancestor independently of its parent, making its results visible to that ancestor and thus improving the concurrency in the **transaction** subtree beneath that ancestor. A corresponding scoped undo approach is also developed that allows a **transaction** hierarchy with subtransactions having mixed **commit** scopes to partially and consistently roll back upon failure, then restart and roll forward. (4 refs).

Descriptors

<u>concurrency-control</u>; <u>database-management-systems</u>; <u>database-theory</u>; <u>transaction-processing</u>.

Keywords

commit scope control; nested transactions; subtransactions; parent transactions; databases; atomicity; concurrency control; transaction hierarchy; scoped commitment; selected ancestor; transaction subtree; scoped undo approach; mixed commit scopes; failure; restart; roll back; roll

forward.

Classification codes

C6160 (Database management systems (DBMS)). C4250 (Database theory). (Data handling techniques). C6130

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INSPEC - 1969 to date (INZZ)

Accession number & update

5073017, C9511-6160B-023; 951004.

Title

Hybrid atomicity for **nested transactions**.

Author(s)

Fekete-A; Lynch-N; Weihl-W-E.

Author affiliation

Sydney Univ, NSW, Australia.

ICDT 92. International Conference on **Database** Theory, Berlin, Germany, 14-16 Oct. 1992. In: Theoretical-Computer-Science (Netherlands), vol.149, no.1, p.151-78, 18 Sept. 1995.

CODEN

TCSCDI.

ISSN

ISSN: 0304-3975, CCCC: 0304-3975/95/ (\$09.50).

Publication year

1995.

Language

EN.

Publication type

CPP Conference Paper, J Journal Paper.

Treatment codes

P Practical.

Abstract

This paper defines the notion of hybrid atomicity for nested transaction systems, and presents and verifies an algorithm providing this property. Hybrid atomicity is a modular property; it allows the correctness of a system to be deduced from the fact that each object is implemented to have the property. It allows more concurrency than dynamic atomicity, by assigning timestamps to transactions at commit. The Avalon system provides exactly this facility. The results in this paper extend earlier work using the same model for locking and **timestamp-based** algorithms, providing further evidence for the generality of the approach. However, there are some subtle differences with the definitions used in earlier work, showing the difficulties of developing precise general models for nested transaction systems. (16 refs).

Descriptors

abstract-data-types; concurrency-control; transaction-processing.

hybrid atomicity; nested transactions; modular property; timestamps; Avalon system; locking; timestamp based algorithms; nested transaction systems.

Classification codes

C6160B (Distributed databases).
C6150J (Operating systems).
C6120 (File organisation).

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INSPEC - 1969 to date (INZZ)

Accession number & update

4941359, C9506-6160B-005; 950511.

Title

Interoperability between PCTE and external database systems: standard transactions and beyond.

Author(s)

Gabriel-P; Micknis-S; Schween-H.

Author affiliation

ISST, Fraunhofer Inst for Software Eng & Syst Eng, Berlin, Germany.

Source

Proceedings of PCTE '94, San Francisco, CA, USA, 29 Nov.-1 Dec. 1994.

In: PCTE-Technical-Journal (UK), no.2, p.351-68, 1994.

Publication year

1994.

Language

EN.

Publication type

CPP Conference Paper, J Journal Paper.

Treatment codes

P Practical.

Abstract

In order to cope with consistency-preserving operations (i.e. transactions) over distributed and heterogeneous database systems, all database systems involved must support a certain transaction protocol. Unfortunately, the ECMA-PCTE standard does not contain a protocol of this kind. The common protocol for distributed transactions is the two-phase commit. An increasingly accepted industrial standard for distributed transactions covering the two-phase commit is the XA specification by the X/Open group which is supported by most of the UNIX-database vendors. In this paper, we propose a concept for an interface that fulfils the XA specification and can be implemented on top of a system conforming to the ECMA-PCTE standard. Recently, more and more (distributed) applications have been based on (transactions on) database systems, e.g. CAD/CAM systems or software engineering environments which are typical PCTE applications. The two-phase commit protocol is not always adequate for all these often long-lived kinds of transactions. A great number of non-standard transactions have been suggested to overcome problems like inefficient blocking of data or lack of cooperation between complex activities. However, currently available transaction managers just support the two-phase commit. In the second part of the paper, we present a concept for a transaction system which allows the processing of both standard and non-standard transactions (including nested transactions, SAGAS, split-and-join transactions and S-transactions) over different and distributed database systems. (16 refs).

Descriptors

<u>distributed-databases</u>; <u>open-systems</u>; <u>programming-environments</u>; <u>protocols</u>; <u>software-portability</u>; <u>transaction-processing</u>.

Keywords

interoperability; two phase **commit** protocol; external **database** systems; standard **transactions**; consistency preserving operations; distributed **database** systems; heterogeneous **database** systems; **transaction** protocol; ECMA PCTE standard; XA specification; CAD CAM systems; software engineering environments; inefficient **data** blocking; cooperation; **nested transactions**; SAGAS; split and join

transactions; S transactions; CORBA. Classification codes

C6160B (Distributed databases).
C6115 (Programming support).
C5640 (Protocols).

Copyright statement

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INSPEC - 1969 to date (INZZ)

Accession number & update

4664013, C9406-6160K-009; 940427.

Title

A **semantic-based nested transaction** model for intelligent and cooperative information systems.

Author(s)

Haghjoo-M-S; Papazoglou-M-P; Schmidt-H-W; Ed. by Huhns-M; Papazoglou-M-P; Schlageter-G.

Author affiliation

Dept of Comput Sci, Australian Nat Univ, Canberra, ACT, Australia.

Source

Proceedings of International Conference on Intelligent and Cooperative Information Systems, Rotterdam, Netherlands, 12-14 May 1993.

Sponsors: IEEE, ACM, AAAI, IFIP, IPSJ, NGI.
In: p.321-31, 1993.

ISSN

ISBN: 0-8186-3135-X, CCCC: 0 8186 3135 X/93/ (\$3.00).

Publication year

1993.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

T Theoretical or Mathematical.

Abstract

Intelligent and cooperative information systems (ICIS) involve upgraded models for **transaction** support for large distributed **data** /knowledge intensive applications. The use of long-lived **transactions** results in the introduction of a flexible **transaction** model which employs weak integrity and optimistic **commit** mechanisms for **transactions** relying on compensating and contingency **transactions** to recover from potential semantic failures. An **open-nested transaction** model for ICIS is introduced. It provides linguistic facilities for defining and controlling long-lived complex **transactions** (comprising related units of work) by taking into account the semantics of distributed computations. The fact that the proposed **transaction** model is grafted on to an appropriately extended concurrent object-oriented programming language allows exhibiting a high degree of parallelism inherent in distributed **transaction-oriented** applications. (28 refs).

Descriptors

cooperative-systems; database-theory; deductive-databases;
distributed-databases; information-systems; object-oriented-languages;
parallel-languages; system-recovery; transaction-processing.

Keywords

semantic **based nested transaction** model; intelligent information systems; cooperative information systems; upgraded models; **transaction** support; large distributed **data** applications; knowledge

intensive applications; related work units; weak integrity; optimistic **commit** mechanisms; compensating **transactions**; contingency **transactions**; semantic failure recovery; open **nested transaction** model; linguistic facilities; long lived complex **transactions**; distributed computations; extended concurrent object oriented programming language; parallelism; distributed **transaction** oriented applications.

Classification codes

```
C6160K (Deductive databases).
C6110J (Object-oriented programming).
C6140D (High level languages).
C6160B (Distributed DBMS).
C4250 (Database theory).
```

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INSPEC - 1969 to date (INZZ)

Accession number & update

4476179, C9310-6160Z-008; 930902.

Title

Transaction management in design databases.

Author(s)

Kumar-M; Wong-J.

Author affiliation

Dept of Comput Sci, Iowa State Univ, Ames, IA, USA.

Source

Journal-of-Systems-and-Software (USA), vol.22, no.1, p.3-15, July 1993.

CODEN

JSSODM.

ISSN

ISSN: 0164-1212, CCCC: 0164-1212/93/ (\$6.00).

Publication year

1993.

Language

EN.

Publication type

J Journal Paper.

Treatment codes

A Application; P Practical.

Abstract

Conventional **data base** systems are not suitable for handling advanced applications encountered in engineering, such as CAD/CAM, CASE, CAE, and VLSI design. The **data bases** in such environments, also called design **data bases**, are characterized by the presence of many complex **data** objects denoted by a large number of small tables, as opposed to a few large tables encountered in conventional **data bases**. The **transaction** model used in tracking **data bases** for banking, inventory control, and other such applications use view serializability as the correctness criterion. While view serializability is appropriate for tracking **data bases**, it is unnecessarily restrictive for engineering **data bases**. The authors propose a **transaction** model that is suitable for accessing shared design **data based** on coserializability. The **transaction** model supports long-duration **transactions** with intermediate **commit** points. In addition to the conventional **nested transaction** hierarchy, the model allows for cooperation between **nested** design **transactions** needed in a design environment. (20 refs).

Descriptors

CAD-CAM; database-management-systems; transaction-processing.

Keywords

design databases; CAD CAM; CASE; CAE; VLSI design; transaction model; banking; inventory control; shared design data; coserializability; long duration transactions.

Classification codes

C6160Z (Other DBMS).
C6150J (Operating systems).
C7480 (Production engineering).

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INSPEC - 1969 to date (INZZ)

Accession number & update

4468054, B9310-6210L-050, C9310-5620-033; 930811.

Title

Applications of transaction processing for session management in multi-media information networks.

Author(s)

Kramer-M; Mohan-S.

Author affiliation

Bellcore, Morristown, NJ, USA.

Source

GLOBECOM '92. Communication for Global Users. IEEE Global Telecommunications Conference. Conference Record. (Cat. No.92CH3130-2), Orlando, FL, USA, 6-9 Dec. 1992, p.764-9 vol.2. Sponsors: IEEE.

Published: IEEE, New York, NY, USA, 1992, 3 vol. xlviii+1920 pp.

ISSN

ISBN: 0-7803-0608-2, CCCC: 0 7803 0608 2/92/ (\$3.00).

Publication year

1992.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

P Practical.

Abstract

Session management of complex multimedia calls a network-provided **transaction-oriented** service to a client is discussed. The authors suggest a set of goal-oriented policies that modify the all-ornothing **transaction** semantics inherent in traditional **transaction** processing to accommodate more optimistic **commit** protocols that take corrective actions later if resources are found to be in inconsistent states. The use of **semantics-based** and **nested transactions** in allocating network resources is also suggested. These modifications are expected to improve overall resource utilization and reduce latency. (12 refs).

Descriptors

multimedia-systems; protocols; telecommunication-network-management; transaction-processing.

Keywords

network resource allocation; **transaction** processing; session management; information networks; complex multimedia; goal oriented policies; **commit** protocols.

Classification codes

```
B6210L (Computer communications).
B6210C (Network management).
B6150M (Protocols).
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C5620 (Computer networks and techniques).
C5640 (Protocols).
C6150N (Distributed systems).
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INSPEC - 1969 to date (INZZ)

Accession number & update

4310729, C9302-4250-021; 921216.

Title

Hybrid atomicity for nested transactions.

Author(s)

Fekete-A; Lynch-N; Weihl-W-E; Ed. by Biskup-J; Hull-R.

Author affiliation

Dept of Comput Sci, Sydney Univ, NSW, Australia.

Source

Database Theory - ICDT '92. 4th International Conference Proceedings, Berlin, Germany, 14-16 Oct. 1992, p.216-30.

Published: Springer-Verlag, Berlin, Germany, 1992, ix+449 pp.

ISSN

ISBN: 3-540-56039-4.

Publication year

1992.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

T Theoretical or Mathematical.

Abstract

Defines the notion of hybrid atomicity for **nested transaction** systems, and presents and verifies an algorithm providing this property. Hybrid atomicity is a modular property; it allows the correctness of a system to be deduced from the fact that each object is implemented to have the property. It allows more concurrency than dynamic atomicity, by assigning timestamps to **transactions** at **commit.** The Avalon system provides exactly this facility. (17 refs).

Descriptors

concurrency-control; database-theory; distributed-databases; program-verification; transaction-processing.

Keywords

algorithm verification; system correctness; **nested transactions**; hybrid atomicity; modular property; concurrency; timestamps; **commit**; Avalon system.

Classification codes

C4250	(Database theory).
C6160B	(Distributed DBMS).
C4240	(Programming and algorithm theory).

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INSPEC - 1969 to date (INZZ)

Accession number & update

4117507, C9205-6110B-034; 920320.

Title

Cooperating transactions and workspaces in EPOS: design and preliminary implementation.

Author(s)

Conradi-R; Malm-C-C; Ed. by Andersen-R; Bubenko-J-A-Jr; Solvberg-A.

Author affiliation

Norwegian Inst of Technol, Trondheim, Norway.

Source

Advanced Information Systems Engineering. Third International Conference CAiSE '91 Proceedings, Trondheim, Norway, 13-15 May 1991, p.375-92.

Sponsors: Andersen Consulting.

Published: Springer-Verlag, Berlin, Germany, 1991, vi+578 pp.

ISBN: 3-540-54059-8.

Publication year

1991.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

P Practical.

Abstract

EPOS offers change-oriented versioning (COV) for software configuration management (CM). The EPOSDB has long and nested transactions. EPOS also supports software process management (PM) within a transaction and its workspace through task networks and their project infrastructure. The paper deals with EPOS extensions for inter-transaction coordination. This relies on intentional configuration descriptions and ambitions to describe change propagation into other versions. Raw (textual) merging comes for free in the COV model. Semantic merging is facilitated by pre-commit propagation and negotiation among overlapping transactions, according to agreed-upon protocols. (21 refs).

Descriptors

configuration-management; expert-systems; software-engineering; systems-analysis; transaction-processing.

Keywords

expert system for program and system development; semantic merging; EPOS; change oriented versioning; software configuration management; nested transactions; software process management; task networks; project infrastructure; inter transaction coordination; intentional configuration descriptions; ambitions; protocols.

Classification codes

C6110B (Software engineering techniques). C6170 (Expert systems). C0310F (Software development management).

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INSPEC - 1969 to date (INZZ)

Accession number & update

4012715, C91072726; 911114.

Title

Unilateral commit: a new paradigm for reliable distributed transaction processing.

Author(s)

Hsu-M; Silberschatz-A.

Author affiliation

Digital Equipment Corp, Mountain View, CA, USA.

Source

Proceedings. Seventh International Conference on **Data** Engineering (Cat. No.91CH2968-6), Kobe, Japan, 8-12 April 1991, p.286-93.

Sponsors: IEEE.

Published: IEEE Comput. Soc. Press, Los Alamitos, CA, USA, 1991, xviii +766 pp.

ISSN

ISBN: 0-8186-2138-9, CCCC: CH2968-6/91/0000-0286 (\$01.00).

Publication year

1991.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

P Practical.

Abstract

An alternative approach to distributed **transaction** processing **based** on the unilateral **commit** paradigm (UCP) and on persistent transmission is proposed. Instead of executing a unit of work as a single distributed **transaction**, as in the traditional **transaction** execution paradigm, opportunities are looked for to execute it as a structured set or a sequence of smaller, possibly single-site atomic **transactions**. Each such **transaction**, once executed, is committed independently of other **transactions** in the task. A method for rigorously maintaining the linkage between the steps is provided for by a persistent transmission mechanism. It is argued that UCP is especially attractive since it relies on a site's ability to execute conventional flat local **transactions** and does not require additional capabilities such as the ability to execute **nested transactions**. (23 refs).

Descriptors

distributed-databases; transaction-processing.

Keywords

paradigm; reliable distributed **transaction** processing; unilateral **commit** paradigm; structured set; atomic **transactions**.

Classification codes

C6160B (Distributed DBMS).

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INSPEC - 1969 to date (INZZ)

Accession number & update

3263252, C89003421; 890000.

Title

An approach to efficient distributed transactions.

Author(s)

Ancilotti-P; Bertolino-A; Fusani-M.

Author affiliation

Pisa Univ, Italy.

Source

Distributed-Computing (West Germany), vol.2, no.4, p.201-12, 1988.

CODEN

DICOEB.

ISSN

ISSN: 0178-2770.

Publication year

1988.

Language

EN.

Publication type

J Journal Paper.

Treatment codes

P Practical.

Abstract

Most distributed systems proposed on the basis of the concept of atomic action or **transaction** strongly limit parallelism, thus reducing their level of efficiency. Features of efficiency in a distributed **transaction** system are investigated. Two mechanisms are proposed in order to enhance potential concurrency both among different **transactions** and within a single **transaction** during the **commit** phase: a synchronization mechanism has been designed which suggests an approach to concurrency control by allowing the release of acquired locks before **transaction** completion. The possibility of exploiting this mechanism to implement **nested transactions** is also discussed; and a distributed **commit** protocol is developed which enhances concurrency among the participants in an atomic action, thus achieving quick execution with high modularity. (19 refs).

Descriptors

<u>distributed-processing</u>; <u>operating-systems-computers</u>; <u>parallel-programming</u>; <u>protocols</u>; <u>synchronisation</u>.

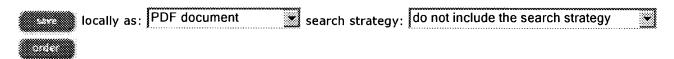
Keywords

efficient distributed **transactions**; atomic action; **transaction**; parallelism; distributed **transaction** system; concurrency; synchronization mechanism; locks; **nested transactions**; distributed **commit** protocol.

Classification codes

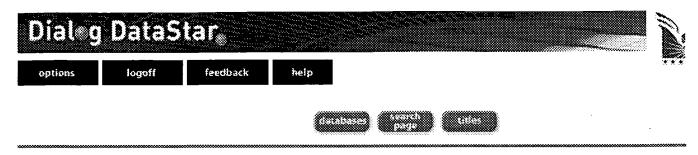
C6150J (Operating systems).

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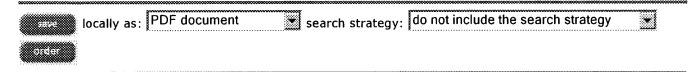
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INSPEC - 1969 to date (INZZ)

Accession number & update

7535742, C2003-03-4250-008; 20030224.

Title

Simulation of advanced transaction models using GOLOG.

Author(s)

Kiringa-I; Ed. by Ghelli-G; Grahne-G.

Author affiliation

Dept of Comput Sci, Toronto Univ, Ont, Canada.

Source

Database Programming Languages. 8th International Workshop, DBPL 2001. Revised Papers, Frascati, Italy, 8-10 Sept. 2001.

In: p.318-41, 2002.

ISSN

ISBN: 3-540-44080-1.

Publication year

2002.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

T Theoretical or Mathematical.

Abstract

We propose a logical framework for describing, reasoning about, and simulating **transaction** models that relax some of the ACID (atomicity-consistency-isolation-durability) properties of classical **transactions.** Such extensions, usually called advanced **transaction** models (ATMs), have been proposed for dealing with new **database** applications involving long-lived, endless, and cooperative activities. Our approach appeals to non-Markovian theories, in which one may refer to past states other than the previous one. We specify an ATM as a suitable non-Markovian theory of the situation calculus, and its properties, including the relaxed ACID properties, as formulas of the same calculus. We use our framework to formalize classical and closed **nested transactions.** We first formulate each ATM and its properties as a theory of a certain kind and formulas of the situation calculus, respectively. We then define a legal **database** log as one whose actions are all possible and in which all the **commit** and **rollback** actions must occur whenever they are possible. After that, we show that the known properties of the ATM, including the (possibly relaxed) ACID constraints, are properties of legal logs and logical consequences of the theory corresponding to that ATM. Finally, we show how to use such a

specification as a **background** theory for **transaction** programs written in the situation calculus **based** programming language GOLOG. (23 refs).

Descriptors

<u>concurrency-control</u>; <u>database-languages</u>; <u>database-theory</u>; <u>digital-simulation</u>; <u>relational-algebra</u>; <u>transaction-processing</u>.

Keywords

advanced **transaction** models; GOLOG; simulation; reasoning; relaxed ACID properties; atomicity consistency isolation durability properties; **database** applications; nonMarkovian theories; past states; closed **nested transactions**; classical **transactions**; legal **database** log; **rollback** actions; **commit** actions; **transaction** programs; situation calculus **based** programming language.

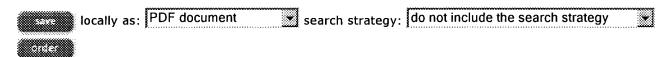
Classification codes

C4250	(Database theory).	
C6140D	(High level languages).	
C6160	(Database management systems (DBMS))	
C4210	(Formal logic).	

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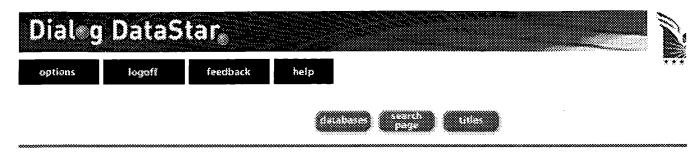
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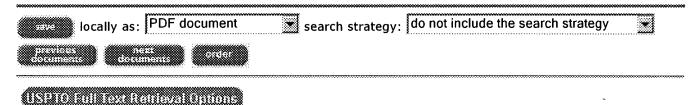
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INSPEC - 1969 to date (INZZ)

Accession number & update

6619905, B2000-07-6150M-074, C2000-07-5640-068; 20000601.

Title

Hybrid concurrency control and recovery for **multi-level** transactions.

Author(s)

Schewe-K-D; Ripke-T; Drechsler-S.

Author affiliation

Inst of Comput Sci, Tech Univ Clausthal, Germany.

Source

Acta-Cybernetica (Hungary), vol.14, no.3, p.419-53, 2000. , Published: Jozsef Attila Univ. Dept. Inf.

CODEN

ACCYDX.

ISSN

ISSN: 0324-721X.

Availability

SICI: 0324-721X(2000)14:3L.419:HCCR; 1-P.

Publication year

2000.

Language

EN.

Publication type

J Journal Paper.

Treatment codes

P Practical.

Abstract

Multi-level transaction schedulers adapt conflict-serializability on different levels. They exploit the fact that many low-level conflicts (e.g. on the level of pages) become irrelevant, if higher-level application semantics is taken into account. Multi-level transactions may lead to an increase in concurrency. It is easy to generalize locking protocols to the case of multi-level transactions. In this, however, the possibility of deadlocks may diminish the increase in concurrency. This stimulates the investigation of optimistic or hybrid approaches to concurrency control. Until now no hybrid concurrency control protocol for multi-level transactions has been published. The new FoPL protocol (Forward oriented Concurrency Control with Preordered Locking) is such a protocol. It employs access lists on the database objects and forward oriented commit validation. The basic test on all levels is

based on the reordering of the access lists. When combined with queueing and deadlock detection, the protocol is not only sound, but also complete for multi-level serializable schedules. This is definitely an advantage of FoPL compared with locking protocols. The complexity of deadlock detection is not crucial, since waiting transactions do not hold locks on database objects. Furthermore, the basic FoPL protocol can be optimized in various ways. Since the concurrency control protocol may force transactions to be aborted, it is necessary to support operation logging, It is shown that as well as multi-level locking protocols can be easily coupled with the ARIES algorithms. This also solves the problem of rollback during normal processing and crash recovery. (24 refs).

Descriptors

computational-complexity; concurrency-control; protocols; system-recovery.

Keywords

hybrid concurrency control; recovery; multi level transactions; transaction schedulers; conflict serializability; low level conflicts; application semantics; locking protocols; FoPL protocol; database objects; forward oriented commit validation; queueing; deadlock detection; complexity; ARIES algorithms.

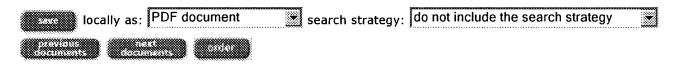
Classification codes

B6150M	(Protocols).
C5640	(Protocols).
C6150J	(Operating systems).
C6150N	(Distributed systems software).
C4240C	(Computational complexity).
C6150G	(Diagnostic, testing, debugging and evaluating systems).

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	L81	L80 and ((start\$ or abort\$ or complet\$ or end\$ or rollback\$ or (roll\$ adj1 back\$) or roll-back\$ or roll\$-back\$) near transaction\$)	38
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	L55	L54 and (hierarch\$ or level\$ or branch\$ or node\$ or layer\$)	63
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	L19	L18 and (windows or menu\$ or icon\$ or folder\$ or file\$ or director\$ or intefac\$ or (web adj1 site\$) or (web adj1 page\$) or (internet adj1 site\$) or (internet adj1 page\$) or www or (world adj1 wide adj1 web) or internet or http or html or hypertext or hyperlink\$ or url\$)	24079
	L18	(hierarch\$ or navigat\$ or level\$ or layer\$ or node\$ or branch\$).ti.	61766
	L17	L7 and (windows or menu\$ or icon\$ or folder\$ or file\$ or director\$ or intefac\$ or (web adj1 site\$) or (web adj1 page\$) or (internet adj1 site\$) or (internet adj1 page\$) or www or (world adj1 wide adj1 web) or internet or http or html or hypertext or hyperlink\$ or url\$)	3449
	L16	L6 and (windows or menu\$ or icon\$ or folder\$ or file\$ or director\$ or intefac\$ or (web adj1 site\$) or (web adj1 page\$) or (internet adj1 site\$) or (internet adj1 page\$) or www or (world adj1 wide adj1 web) or internet or http or html or hypertext or hyperlink\$ or url\$)	431
	L15	(L13 or L14) and (windows or menu\$ or icon\$ or folder\$ or file\$ or director\$ or intefac\$ or (web adj1 site\$) or (web adj1 page\$) or (internet adj1 site\$) or (internet adj1 page\$) or www or (world adj1 wide adj1 web) or internet or http or html or hypertext or hyperlink\$ or url\$)	22
	L14	(L6 or L7) and (rollback or rollbacktransaction or (rollback adj1 transaction) or rollback-transaction)	9
	L13	(L6 or L7) and (commit or committransaction or (commit adj1 transaction) or commit-transaction)	20
	L12	L11 and (hierarch\$ or tree\$ or level\$ or layer\$ or branch\$ or node\$)	95
	L11	L6 and (interfac\$ or (world adj1 wide adj1 web) or internet or www or (internet adj1 site\$) or (internet adj1 page\$) or (web adj1 site\$) or (web adj1 page\$) or hyperlink\$ or hypertext or html or http or url\$)	131
	L10	L6 and ((interfac\$ or (world adj1 wide adj1 web) or internet or www or (internet adj1 site\$) or (internet adj1 page\$) or (web adj1 site\$) or (web adj1 page\$) or hyperlink\$ or hypertext or html or http or url\$) near nest\$)	7
	L9	L8 and (hierarch\$ or tree\$ or level\$ or layer\$ or branch\$ or node\$)	39

	L8	L6 and ((microsoft near windows) or windows or menu\$ or icon\$ or folder\$)	56
\square	L7	nest\$.ab.	9214
	L6	nest\$.ti.	1899
n	L5	((interfac\$ or (world adj1 wide adj1 web) or internet or www or (internet adj1 site\$) or (internet adj1 page\$) or (web adj1 site\$) or (web adj1 page\$) or hyperlink\$ or hypertext or html or http or url\$) near nest\$)	122
	L4	L3 and nest\$.ab.	1
	L3	L2 and nest\$.ti.	1
	L2	L1 and (hierarch\$ or tree\$ or level\$ or layer\$ or branch\$ or node\$)	144
\Box	Ll	((microsoft near windows or windows or menu\$ or icon\$ or folder\$) near nest\$)	174

END OF SEARCH HISTORY